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ABSTRACT

This study investigates the association between teacher conceptual level and teacher behavior and attitudes in a minimally-structured type learning activity. A sample was selected from a pool of student teachers in the elementary teacher training program at Syracuse University. Each was given a lesson which was an episode from a simulation prepared by a researcher. The teacher selected five students from the class who assumed the role of Town Board and discussed five options for expenditure of money and justified reasons for the chosen option. Upon completion of the taped lesson the teacher completed a questionnaire. Basic data was obtained through analysis of the taped lesson and questionnaire. The study suggests that all teachers are not equally successful in using simulation, and that conceptual level may be an important factor in teacher use in a simulations activity. It seems that minimally structured activities would be more satisfactorily used by high conceptual level teachers than by low conceptual level teachers. There is, however, no guarantee that the teacher will interpret or use the simulation activity for its intended purpose, and low conceptual level teachers may adapt it to suit their normal teaching behavior. (MJM)

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CONCEPTUAL LEVEL AS A DETERMINANT OF TEACHER
BEHAVIOR AND ATTITUDES IN A NON-STRUCTURED
TYPE LEARNING ACTIVITY

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The Purpose of This Study

The purpose of this study was to investigate the association between teacher conceptual level and teacher behavior and attitudes in a minimally-structured type learning activity--in this instance, an episode from a simulation.

Hunt, in explaining the relationship between the Conceptual Systems Theory and instruction, stated the belief that "Given the characteristics of low conceptual level learners . . . the prediction follows that they will profit more from an educational approach which is providing a high degree of structure." He further states that "Given the characteristics of high conceptual learners . . . they should either profit more from approaches which are low in structure, or degree of structure may not affect their performance" (Hunt, 1970). In students, the theory states, there is an inverse relationship between conceptual level and degree of structure. This researcher raises the question as to whether this is also valid regarding teachers. Will teachers who are of high conceptual level prefer to work in less structured learning activities than their colleagues who have a lower conceptual level?

A secondary question in terms of Conceptual Systems Theory, but of prime importance in considering low structured learning situations, is, will there be a variance of teacher performance and teacher attitude if a differentiation of teachers is made on the basis of conceptual level?

The Relevance of Conceptual Systems Theory to Education

In methodological terms, it could be hypothesized that the lower conceptual level teacher would feel more comfortable and might be

more effective teaching from a textbook than a higher conceptual level teacher who would likely resent this confinement. It could be further hypothesized that lower conceptual level teachers might approach the new math, the new social studies, the new linguistics with greater fears and less conviction than will a higher conceptual level teacher. If sufficient evidence could be compiled from several research studies which substantiate this speculation, then the implications are great in terms of teacher training, administration in the schools, curriculum development, and perhaps even teacher selection.

There are several teaching activities and techniques which may be used to initiate such activity. The use of group study techniques, role play, small group discussion, simulation, independent and individual study are all examples of techniques which might provide a basis for the study of differentiated teacher behaviors. Those techniques perceived as being more traditional and exhibiting greater classroom control such as teaching from the text, question-answer discussion, or other similar standard procedures might not provide the sought after differentiation since higher conceptual level whereas the converse is not anticipated (Harver, Hunt, Schroder, 1960).

Simulation

The use of simulation, or episode from a simulation, could provide that focus for a study designed to investigate whether such teacher differentiation does exist. Even a cursory review of the literature relative to simulation reveals the displaced and non-traditional role of the instructor. Three of the nation's leading authorities on simulation--Saramé Boocock, Clark Abt, and

James S. Coleman--make little reference to the teacher within the simulation activity. In fact, many of the proponents of simulation, perhaps erroneously so, claim this aspect of simulation as one of its leading strengths. However, Boocock (1966) suggests, as a result of later studies, that one of the prime variables in the effective use of simulation is the teacher.

A review of simulation game manuals generally describes very different roles to be played by the teacher, with several manuals advising him to do little other than introduce the activity and watch (Napoli, Crisis, Congressman, Democracy, Life-Career, Dangerous Parallel).

Despite the fact that simulation games have been in use in the schools in excess of ten years, comparatively little reliable research has been done regarding their effectiveness in the classroom. Moving from exaggerated claims of a new panacea to prevent student boredom to what Boocock (1966) calls "realistic optimism" the proponents of simulation games continue to extoll the virtues of gaming. Many claims have been made, often unsupported by sound empirical evidence, ranging from Coleman's emphasis on the competitive aspects (1968) to Boocock's notion that simulation games best aid the teacher because they tend to increase the motivation of the student (1966).

However, even the most ardent supporters of simulation activities accept as reality the notion that games are not most efficient means of increasing factual information. Several studies demonstrate that simulations do less well with this objective than more traditional methods do (McKenney & Dill, 1965; Zaltman, 1966). However, at least since the impact of Bruner's Process of Education

(1960) re-emphasized by Silberman's Crisis in the Classroom (1970), the notion of using factual information as the prime measure of effectiveness of any method has increasingly come into disrepute. The emphasis is becoming more a concern of conceptual understanding. Both simulation game manuals and the writings of simulation proponents identify conceptual understanding as their chief goal, not factual learning; -- except that which is necessary to achieve this end. It would seem both justified and logical then that research should concern itself within the realm of these stated or implied objectives and that studies be instituted to examine how best they might operate within the educational setting. It is hoped that this study may add some knowledge toward that end by focusing on the use of conceptual level as a determinant of teacher behavior during such an activity.

Method

The sample was selected from a pool of student teachers enrolled in the elementary teacher training programs at Syracuse University, 1970-1971. The researcher approached the teachers at their student teaching seminars, gave a brief description of their role in the research, and asked for volunteers.

Each of the subjects was given a lesson which was an episode from a simulation prepared by one of the researchers. Briefly this episode provided that the teacher would select five students from the classroom. The students would assume the role of the Town Board or City Council or whatever else the local governing body of that community might be. They were to discuss five options for expenditure of money and justify their reasons for selecting the

option that they thought would best benefit their constituents. Upon the completion of the taped lesson the teacher was to complete a questionnaire. Interaction analysis of the taped lesson and an analysis of various questions on the questionnaire form the basis of the data for the research.

Results

Hypothesis 1a. Low conceptual level teachers will use significantly less indirect teaching behavior during the lessons as measured by the Flanders I Ratio than will high conceptual level teachers.

Hypothesis 1a was accepted at the .005 level of significance. The ϕ (phi) test of association was .49. This indicates that as predicted, low conceptual level teachers would use significantly less indirect teaching behaviors than would high conceptual level teachers. It does not seem compatible with the objectives of simulation to use the more direct teaching methods.

Hypothesis 1b. Low conceptual level teachers will engage in more teacher talk as defined by Flanders (1967) than will high conceptual level teachers.

Hypothesis 1b was accepted at the .001 level of significance. It should be noted that the entire low conceptual group scored at, or above, the median score for teacher talk. Again with relative to the use of simulation it seemed that the lower conceptual teacher talked a

disproportionate amount of time. This again seems to be in opposition to the stated purposes of simulation usage.

Hypothesis 2. Low conceptual level teachers will use significantly more time to introduce the simulation episode than will the high conceptual level teacher.

Hypothesis 2 was accepted at the .005 level of significance. (it is difficult to ascertain) Given the limitation of this study, the real reasons why the teachers behaved as they did, however it could be conjectured that the lower group took more time to introduce the subject in order to provide a more structured setting. The higher conceptual level teacher, for what ever their reasons were for acting as they did, apparently saw little need for the necessity of providing a structured setting. Of course, it is possible to over-generalize it is possible to over-generalize from this limited sample, particularly into this question. However, it would seem, that given the nature of the lesson all that was necessary, was for the teacher to give a very brief introduction and allow the students to take over from there. Other reasons enter into it, possibly that the lower conceptual level teacher may distrust the student's ability to perform this task without adequate explanation or controls. It may also be that this teacher does not have enough confidence in himself to carry on this type of learning activity without providing a great deal of structure. Whatever the reason, again, it would seem that a great deal of time spent in providing the structure may not be entirely to the best advantage in the use of simulation.

Hypothesis 3. During the debriefing stage, low conceptual level teachers will use significantly less indirect teaching behaviors as measured by the Flanders I-Ratio than will high conceptual level teachers.

Hypothesis 3 was accepted at the .01 level of significance. This indicated that there was relatively little change in teacher behavior in the debriefing stage as opposed to the actual lesson itself; The types of behavior used by the teachers remained consistent, for both lesson and debriefing. It was found that the indirect teacher tended to remain indirect; that the direct teacher tends to remain direct.

Hypothesis 4. Low conceptual level teachers will have a significantly lower perceived degree of satisfaction toward the low structured activity as measured by the Likert-type question on the Teacher Questionnaire than will high conceptual level teachers.

Hypothesis 4 was accepted at the .025 level of significance. As predicted, low conceptual level teachers expressed a lower degree of satisfaction using this type of an activity than did the higher conceptual teachers.

Hypothesis 5. Low conceptual level teachers will attribute perceived student gains to teacher efforts to a significant degree more than will high conceptual level teachers.

Hypothesis 5 was accepted at the .001 level of significance. It was noted that it is difficult to measure whether or not the difference between the high conceptual level group and the low conceptual level group was a result of "actual effort" or simply a result of "perceived effort." In any case the data analysis relative to Hypothesis

4 and Hypothesis 5 yielded rather dramatic results again especially when one considers a rather small sample size. It was predicted that the low conceptual level teacher, partially as a result of his need for control and structure would express a lower degree of perceived teacher satisfaction than the higher conceptual teacher. This result was further emphasized by the comments at the end of the Teacher Questionnaire. Examples of low conceptual level comments were: "Students are too young for this type of activity" (Grade 6). "Concepts presented in this lesson are too difficult for students to grasp" (Grade 4). "In order to effectively capitalize on an activity such as this, it would be necessary to provide a wealth of background to the vast majority of students" (Grade 6). "Students must first be acquainted with the subject matter before this type of lesson can be useful to them" (Grade 4).

Examples of high conceptual level comments were; "I was amazed at the insight shown by the students" (Grade 4). "It interested both the kids and me more than anything else we've done this year" (Grade 6). "This type of activity greatly motivated by students and they enthusiastically entered into discussion" (Grade 3). "(My satisfaction) may seem high especially after you hear the tape, but compared to their other work, this is much superior" (Grade 5).

It should also be noted that it was difficult to measure whether or not the difference between the high conceptual level group and the low conceptual level group was a result of "actual effort" or simply a result of "perceived effort."

Combining the data of Hypothesis 5 with that of 1b (Teacher Talk) suggests that the low conceptual level teacher may have re-structured the lesson in such a way that they could play the role of teacher as they "normatively" define it.

Hypothesis 6. Low conceptual level teachers will be significantly less disposed toward possible future use of similar teaching activities than will high conceptual level teachers.

Hypothesis 6 was not accepted at the .05 level of significance.

Relative to Hypothesis 6, disposition toward future use, the analysis of the data did not yield significant results. It should be noted that all of the high conceptual group indicated that they would probably use a similar activity in the future, but so did 60 percent of the low conceptual group. This may be accounted for by stating that the novelty of the activity (many of the sample commented both on the questionnaires and to the researcher that this was a unique activity during their pre-service experience) accounted for the higher than predicted score for the low conceptual group. It is also possible that this group was positively reacting to much of the current literature which tends to encourage use of this type of teaching activity. It might be, therefore, that the individuals within the low conceptual group might react favorably to these types of teaching techniques and activities if they had more training or experiences with them. It is interesting to note

that the two members of the low conceptual group who had the highest teacher talk scores (75 percent and 76 percent) both indicated they would not be likely to use this type of activity in the future.

Hypothesis 7. The relationship between "perceived degree of satisfaction" and "success of the group" will be higher for the low conceptual level teacher than for the high conceptual level teacher.

For the high conceptual level group, $r = -.09$, which was as predicted. For the low conceptual level group, $r = .56$, which also was as predicted. However, due to small sample size for each group, the results should be accepted with caution.

Hypothesis 7 which was dealt with as such only because of small sample size, yielded data which indicated a relationship as predicted. The reasoning behind this prediction was that the high conceptual group would tend to focus upon the discussion leading to any possible solution (defined in this study as "success of group," which really was an abbreviation of "success of group in arriving at a solution to the problem") whereas the low conceptual group would tend to focus upon securing a solution. Again, further research seems to be in order to determine the validity of this explanation.

Implications

There appear to be some rather important implications regarding the teaching-learning process which can be drawn

from this study. The first major implication has to do with simulation-designers and simulation-users. It would seem that it would be unreasonable to expect that all teachers would be equally successful using simulation in their classroom. This study seems to imply that one of the major variables which creates this distinction is teacher conceptual level. It might be well, also, for some future researcher to attempt to examine what would happen if the findings of the Rathbone (1970) study were applied to the findings of this study.

A second major implication suggests that low or minimally structured activities would be more satisfactorily used by high conceptual level teachers than by low conceptual level teachers. It would seem wise for supervisory personnel and administrators to be aware of this when advising teaching personnel. The fact that a teacher varies teaching activities does not insure that teacher behaviors will also vary. In this regard, this implication could well form the focus of a future study.

In conclusion it would appear that conceptual level may be an important factor in teacher use in a simulations activity. In fact, it may very well be among the most important factors. It appeared to this researcher that what was happening was that low conceptual level teachers using the episode from the simulation were restructuring it in such a way as to make it another relatively, typical teaching device for them. They took an activity that was

student-centered, which seems to indicate indirect behavior by the teacher, which seemed to indicate a great deal of activity on the part of the student and a rather passive role on the part of the teacher and transformed it into something else. The high conceptual teacher on the other hand, seemed perfectly willing, at least in this sample, to allow the simulation to work.

That this is the most effective way to deal with simulation is not debated here. What is implied by this research, in the most simple terms, is that when we sit down and write a simulation there is no guarantee that that's the way the instructor of that simulation, will use. In fact, the evidence for perhaps a majority of teachers, is to the contrary.

BETWEEN GROUPS COMPARISON OF
INDIRECT SCORES FOR LESSON

HCI. GROUP		LCL GROUP	
Subject	I-Ratio Score	Subject	I-Ratio Score
6	.792	3	.767
8	.875	4	.586
12	.895	5	.342
13	.875	7	.477
15	.731	9	.828
17	.871	10	.621
18	.865	11	.741
20	.878	14	.371
21	.820	16	.649
22	.986	19	.719
Mean = .8588		Mean = .6101	
$s^2 = .0408$		$s^2 = .2501$	
$s = .0639$		$s = .5000$	
MEAN = .7344			
MEDIAN = .7920			
χ^2 at .005 = 7.879			
$\chi^2 = 9.8$			
$\phi = .49$			

BETWEEN GROUPS COMPARISON
OF TEACHER TALK

HCL GROUP		LCL GROUP	
Subject	Percentage Teacher Talk	Subject	Percentage Teacher Talk
6	38	3	43
8	35	4	59
12	18	5	76
13	14	7	75
15	30	9	45
17	19	10	48
18	38	11	45
20	27	14	72
21	30	16	56
22	15	19	41
Mean = 41.3		Mean = 56.0	
$s^2 = 58.4$		$s^2 = 172.6$	
$s = 7.7$		$s = 13.1$	
Mean = 41.3			
Median = 41.0			

T (18) at .001 = 3.61
t (18) = 5.787

BETWEEN GROUPS COMPARISON
OF INTRODUCTION TIME

HCL GROUP			LCL GROUP		
Subject	Time ^a	Rank	Subject	Time ^a	Rank
6	42	2	3	246	13
8	160	8	4	210	12
12	130	7	5	680	19
13	111	5	7	585	18
15	385	15	9	123	6
17	192	11	10	312	16
18	60	3	11	162	9
20	270	14	14	1,170	20
21	107	4	16	430	17
22	12	<u>1</u>	19	183	<u>10</u>
		70			140

Mean = 136.9

Mean = 410.1

Total Mean = 273.5

Median = 192.0

$k = (1)$, H at .005 = 7.879

$H = 8.4$

^aIn seconds.

I-RATIO SCORES AS USED TO ESTABLISH RANK ORDER
FOR THE MANN-WHITNEY U TEST

HCL GROUP			LCL GROUP		
Subject	I-Ratio Score	Rank	Subject	I-Ratio Score	Rank
5	none	-	3	.469	5
8	.778	10	4	.238	1
12	none	-	5	.612	7
13	.930	14	7	.325	3
15	.878	11	9	.959	15
17	.927	13	10	.452	4
18	none	-	11	.548	6
20	.984	16	14	.639	8
21	.742	9	16	.314	2
22	.878	11	19	none	-

On Mann-Whitney U Test for $\alpha = .01$,

U = 9.

U = 9.

BETWEEN GROUPS COMPARISON OF PERCEIVED
TEACHER SATISFACTION

HCL GROUP		LCL GROUP	
Subject	Score	Subject	Score
6	8	3	8
8	7	4	5
12	6	5	3
13	8	7	7
15	9	9	9
17	8	10	6
18	9	11	5
20	9	14	8
21	8	16	3
22	7	19	8

Mean = 7.90

$s^2 = .89$

$s = .94$

Mean = 6.20

$s^2 = 4.16$

$s = 2.04$

Total Mean = 7.05

Median = 8.00

T (18) at .025 = 2.101

T (18) = 2.266.

BETWEEN GROUPS COMPARISON OF PERCEIVED TEACHER EFFORT

NOTE: SUBJECTS WERE RATED ON A LIKERT SCALE OF 0 TO 10. THE HIGHER THE SCORE, THE MORE EFFORT WAS PERCEIVED.

HCL GROUP		LCL GROUP	
Subject	Score ^a	Subject	Score ^a
6	3	3	8
8	1	4	3
12	1	5	7
13	2	7	8
15	3	9	5
17	1	10	6
18	2	11	4
20	3	14	5
21	5	16	7
22	3	19	6

Mean = 2.40

$s^2 = 2.44$

$s = 1.56$

Mean = 5.90

$s^2 = 2.49$

$s = 1.58$

Total Mean = 4.15

Median = 4.00

$t(18)$ at .001 = 3.610

$t(18) = 4.73$

^aperceived students gains, as a result of teacher efforts:

Likert scale 0 to 10.

BETWEEN GROUPS COMPARISON OF DISPOSITION TOWARD
FUTURE USE OF SIMILAR ACTIVITY

HCL GROUP		LCL GROUP	
Subject	Yes-No	Subject	Yes-No
6	Yes	3	Yes
8	Yes	4	Yes
12	Yes	5	No
13	Yes	7	No
15	Yes	9	Yes
17	Yes	10	No
18	Yes	11	Yes
20	Yes	14	Yes
21	Yes	16	No
22	Yes	19	Yes
Yes = 10		Yes = 6	
No = 0		No = 4	

$$\chi^2 \text{ at } .05 = 3.84$$

$$\chi^2 = 2.81$$

COMPARISON OF SATISFACTION SCORES AND "SUCCESS OF GROUP"
FOR EACH CONCEPTUAL LEVEL GROUP

HCL GROUP			LCL GROUP		
Subject	Satisfaction	Success	Subject	Satisfaction	Success
6	8	Yes	3	8	Yes
8	7	Yes	4	5	No
12	6	No	5	3	No
13	8	Yes	7	7	Yes
15	9	Yes	9	9	Yes
17	8	No	10	6	Yes
18	9	No	11	5	Yes
20	9	No	14	8	Yes
21	8	Yes	16	3	Yes
22	7	Yes	19	8	Yes
Mean = 7.9			Mean = 6.2		
Total Mean = 7.05					
Median = 8.00					